

REMARKS

Favorable reconsideration of this application is respectfully requested in view of the above amendments and following remarks. Claims 25 and 26 are added and supported for example page 4, lines 16-21, page 18, lines 16-23, and in the Examples. No new matter has been added. Claims 1, 6-9, 11-14, and 24-26 are pending.

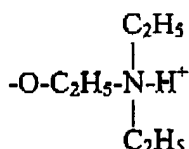
Claims 1, 6, 7-9, 10-14, and 24 were rejected under 35 U.S.C. 103(a) as being unpatentable over Shimomura et al. (Anal. Biochem. 1986 vol. 153, pp 126-131). in view of Sode (WO 02/36779, English translation in US 2004/0023330). Applicants respectfully traverse the rejection to the extent it is maintained.

Claim 1 is directed to a method for purifying a target protein from a protein solution containing the target protein by using liquid chromatography. The target protein is glucose dehydrogenase derived from a microorganism belonging to the genus *Burkholderia* and has α , β , γ subunits. The liquid chromatography comprises a first step of introducing the protein solution into a column filled with a packing agent. The packing agent holds the target protein, and is an ion-exchange resin containing a quaternary ammonium group as an ion-exchange group.

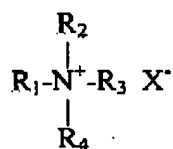
The references cited do not disclose or suggest the features of claim 1. Shimomura et al. is deficient at least because the reference neither discloses nor suggests the claimed specific glucose dehydrogenase nor the specific ion-exchange resin, namely an ion-exchange resin containing a quaternary ammonium group as an ion-exchange group. Sode fails to remedy the deficiencies of Shimomura et al. While Sode discusses glucose dehydrogenase from the genus *Burkholderia* having α , β , and γ subunits, Sode does not disclose or suggest an ion-exchange resin containing a quaternary ammonium group as an ion-exchange group. In fact, paragraph [0145] of Sode only generally references ion-exchange chromatography, but the does not discuss any specific method of chromatography. For at least this reason, claim 1 is patentable over the references cited.

The rejection further states that paragraph [0175] of Sode further references the use of DEAE (diethyl amino ethyl ion exchange) sepharose column maintained at a pH of 6.0 for holding an enzyme solution, and that DEAE sepharose satisfies an ion-exchange resin containing a quaternary ammonium group. Applicants respectfully disagree with this assertion and contend that, at pH 6.0 (which is an acidic condition), the ion-exchange

group of DEAE sepharose takes the following structure which is a protonated form a tertiary amine. Such a structure, however, does not satisfy a quaternary ammonium group. (See below.)



Contrary to a protonated tertiary amine, a quaternary ammonium group is generally represented by the following formula.



(where each of R₁-R₄ represents an alkyl or aryl, while X⁻ represents a pairing anion).

Thus, Sode does not satisfy what is missing from Shimomura et al. and is further removed from the claimed invention. More specifically, Sode does not disclose or suggest an ion-exchange resin containing a quaternary ammonium group as an ion-exchange group as in claim 1, and even if Sode could be combined with Shimomura et al., which Applicants do not concede, there is no reason to conclude that the combination of references would arrive at claim 1 and its dependents.

Favorable reconsideration and withdrawal of the rejection are respectfully requested.

Regarding added claims 25 and 26, Applicants respectfully submit that these claims are separately patentable, because the features of these claims are not disclosed or suggested by the references cited. Claim 25 recites that the first step of using the ion-exchange resin is performed in a non-acidic condition, and claim 26 recites that the first step of using the ion-exchange resin is performed at pH 8. The cited references, for example Sode, do not disclose or suggest using an ion-exchange resin in a non-acidic condition or using an ion-exchange resin at pH 8. For at least these reasons, claims 25 and 26 also are patentable.

Lastly, Applicants respectfully note that the Form 1449 of the Information Disclosure Statement filed August 16, 2007 does not confirm that all of the references listed in the Form 1449 were considered. Particularly, the references listed in the 'Other Documents' section were not initialed by the Examiner. Applicants respectfully request that the Form 1449 be completely initialed and returned to Applicants' representative to confirm that the references were considered.

Applicants also appreciate the Examiner's acknowledgment of Applicants' claim for priority in the previous Office Action dated June 13, 2006. Applicants again note, however, that the claim for priority was acknowledged in the body of the June 13, 2006 Office Action (in the Detailed Action portion of the paper), rather than on the Office Action Summary (PTOL-326), as the proper boxes were left unchecked in this form. Applicants respectfully request that the acknowledgement of priority be indicated on the next communication summary page.

In view of the above amendments and remarks, Applicants believe that the pending claims are in a condition for allowance. Favorable consideration in the form of a Notice of Allowance is respectfully solicited. If any questions arise regarding this communication, the Examiner is invited to contact Applicants' representative listed below.



Dated: September 29, 2008

Respectfully submitted,

HAMRE, SCHUMANN, MUELLER &
LARSON, P.C.
P.O. Box 2902
Minneapolis, MN 55402-0902
(612) 455-3800

By: 

Douglas P. Mueller
Reg. No. 30,300
DPM/baw